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HALEMAUMAU SHOWS SIGNS OF GREAT ACTIVITY AND THE FILLING UP OF THE IMMENSE PIT PROGRESSES

Lava Outburst From the Side of the Well Falls in a Cascade to the Lake.

(Special to The Advertiser.)

VOLCANO HOUSE, June 13.—The volcanic conditions in Hawaii have not changed radically from those existing in February last.

Whether there has been any action at the summit crater is uncertain. Manager Waldron of the Volcano House states that he has seen neither fire nor smoke from that quarter; but a number of others, including E. D. Baldwin, the civil engineer, state that they saw smoke issuing from the top of Mauna Loa as late as yesterday. There may be some slight activity there, but as yet the evidence is insufficient to assert it positively.

At Kilauea the outer crater is unchanged, except that the hot cracks on the side toward the Volcano House and extending north and south some 400 feet, are hotter than they were on February 14, when I last observed them. The rocks are a rosy red to within six inches of the surface, and a stick inserted into a crack bursts into flames in a few seconds. The indications are strong, judging from past experience, that a lake will form at this point.

The process of formation of a lava lake is a simple one. The molten metal beneath gradually melts the rock with which it comes in contact, eating its way upward and outward as the subterranean pressure pushes the lower column upward. When the lava column nears the surface, the gases escaping through the surface cracks carry with them small "spatters" of lava, which fall and congeal around the opening, forming a "spatter cone," from six to thirty feet high. Eventually the eating away of the bank from beneath and the increased weight of the cone through constant accretions of spatter lava from above, overcome the resisting power of the crust over the top of the lava column, and the crust, cone and all, falls into the molten cauldron and a lake is formed, with a diameter of from ten to fifty feet. The process still continues, molten lava being thrown upon and, congealing, weighting down the banks which meanwhile are being melted away from beneath, causing a succession of "caving ins," which eventually widen the lake to a quarter, a half, and even a diameter of a mile.

The chief scene of present activity is in the main central pit of Halemaumau, which was formed by the subsidence of a great lava lake in 1894. This is still between 800 and 1000 feet deep, and approximately a quarter of a mile long, but gives evidence of a great commotion within its walls since February last. The flat floor of recently formed black lava then visible at the extreme bottom has disappeared. The debris slopes from the perpendicular walls to the center of the pit have radically changed their shape, and look as though they had been violently churned up. There are frequent slides and falls of rock from the walls and slopes of the pit, which echo up through the smoke with a sharp metallic sound, producing a weird, uncanny sound which makes one unconsciously move back from the edge of the pit.

There is an immense volume of smoke and sulphur vapor pouring out of the extreme bottom of the pit and from two spots about a third of the way from the bottom. This smoke column was plainly visible from off the Hamakua coast, 70 miles away, and could be seen as easily a hundred miles. There is molten lava visible in the pit, but it is fluctuating in quantity, about two-thirds of the way to the bottom, by reason of the great quantity of smoke, visible only intermittently. When it first appeared it ran down to the bottom of the pit in a magnificent cascade some 200 feet high, forming a lake. This has entirely disappeared under the falling walls and debris slopes, and only the molten lava on the side of the pit was visible.

The normal condition of Halemaumau is the filling of a pit, the building of a cone over it, the formation of one or more lakes about the base of the cone or over the space previously occupied by the pit, followed inevitably by a collapse of the whole structure, forming a new pit. Since 1868 this has happened four times. The last collapse occurred in 1894. The filling up process, delayed longer than usual, has now begun, and the normal production of lakes, blowholes, flows and falls from the pit walls may be expected until the pit is once more full and overflowing.

Meanwhile the sight, while not a particularly exciting one to a person who has seen the stupendous lava fountains of Mauna Loa, or the greater activity of Kilauea in former days, is one of intense interest to any one who desires to observe at first hand how volcanoes work, as well as to the tourist seeking merely the wonderful and the curious.

ERUPTION LONG AND EXTENSIVE

The Hilo Herald says: Conditions at present existing at the crater are so very different from anything in the history of that wonder that scientific men are at a loss to explain them, though they admit that Hawaii's volcano may be affected by the recent disturbance at Martinique. Old residents are free in saying that the present heated term indicates the near approach of a lava flow from some one of the weak spots in Mauna Loa, and that Kilauea may be active for a few weeks before the flow starts.

Manager Waldron is satisfied that the present eruption will continue for some time and will grow in extent. Parties who were down to the crater Sunday night could see no lava, but when a mile away, as they were returning to the Volcano House, they noticed a distinct glow in the smoke. In the day time it is impossible to see the fire in the lake.

Alec Lancaster, the well-known guide at the crater, has made a trail to a ledge of pahoehoe, a distance of 200 feet from the brink, and takes down to that point those visitors who desire to make a closer inspection than can be made at the edge. So far not many have shown a willingness to accept Alec's invitation. There is still a large quantity of steam escaping through the cracks in the vicinity of the Volcano House and many new fissures have opened. On the Kau side of the crater more steam is seen than has been visible there for many years. In Puna there is still considerable steam issuing from the cracks and the heat in that district is intense. Changes in the conditions at the volcano are taking place every day; where heat is greatest one day the earth becomes cool the next, only to be warm again within the next twenty-four hours. This peculiarity is said to have extended to the beach at Reed's bay. A gentleman who has a house there makes the statement that on going to his bathing pool one day he found the sand uncomfortably warm, but the following day it was again cool. On the third day he visited the place in company with a friend and found the sand very warm. In support of his opinions that the change was caused by the changes at the crater he says that particular part of the beach is always in the shade.

Crowds continue to visit Kilauea; on Sunday there were more guests in the dining hall than at any time since the outbreak on Mauna Loa three years ago. Everyone as far as seen by the Herald reporter expresses the opinion that the trip is worth taking, for though the lake may not be what it has been in years gone by it is a wonderful sight. One gentleman who made three visits to the crater in as many days says the lake appears to him to be slowly filling up, and if it were not for the dense smoke he believes the bottom of the crater would prove to be molten lava.

G. R. Gray of Honolulu made the trip last Saturday and went down into the crater several times. He says that on Saturday night the glare from the fires was exceedingly bright and that there was a "swash" like water dashing along the beach. The sound of falling stones and rock could be frequently heard and he believes it to be the sides of the crater caving away under the enormous pressure of the lava surging behind it. All around Halemaumau there is sign of fire; the cracks glow brightly at night and the work of scorching postal cards does not consume more than thirty seconds. He believes there will be a grand eruption in Halemaumau in a short time.

VOLCANOES ARE NOT EXPLOSIVE

Volcanic activity in the craters of Kilauea and Mauna Loa may be expected on or about July 4th and 5th, according to Professor Lyons, the Government meteorologist. The influences which he believes acted upon the craters of the West Indies are likely to manifest themselves on the Island of Hawaii, but as neither of the volcanoes there are explosive, as are those of the West Indies, the most that can be expected from them is a flow of lava as in former times. The influences he refers to are those caused by the sun and the moon.

Professor Lyons outlined to an Advertiser reporter yesterday his theories as to the present volcanic activity in various parts of the globe. He does not believe that it is settled yet as to whether the interior of the earth is molten or solid. Some people accept it as a fact that it is solid but he cannot yet regard it as such. There were four theories advanced by him respecting this phase of the question leading up to the cause for volcanic disturbances. One is that this is a molten globe with a crust; another that the interior is solid and that the pressure is so great that the heat is greater still; another theory is that there is between the crust and solid part a layer of molten matter; still another is that there is a reservoir of molten matter in the region of a volcano.

"What we seem to be concerned about now," said Professor Lyons, "is what starts a volcano to action? The question comes up, Does this molten matter arise simply because of its accumulation, do gases force it up, or is some other pressure exerted? Is it a gas pressure or a mechanical pressure? If so, in either query, what determines it to come at any particular time? I might say that it is reasoned that the molten matter rises up in ducts or tubes connecting the volcano with the interior of the earth. It has been generally regarded as a fact that when the mountains become full of molten matter the volcanoes break out.

"There seems to be some reason why a number of volcanoes break out at the same time. There is one very curious circumstance in craters like Kilauea and Mokuaweoweo, which is that lava comes down, not in the crater, but upon the land outside the crater. This has occurred both at Kilauea and Mokuaweoweo. Here is something that may shed light on the subject. You bend a wire back and forth repeatedly and you develop heat. Take a piece of cube sugar and break it in the dark and you will see a flash of light. The force used in doing it is changed into heat in one case and electricity in another. Now it is known that the crust of the earth is more or less plastic, and it would be likely in that case to feel the force of attraction of the sun and moon. This force of attraction varies as the earth turns on its axis and thus produces a stress upon the material of the earth's crust. Well, now, even if the earth was solid this stress would produce heat, and of course, with the sun and moon together the effect is greater, and we would naturally expect to find more liability of earthquakes and volcanic action at such times.

"In the eruption of 1880-1881, when the lava was flowing from Mauna Loa toward Hilo, and the front end of the flow was many miles from the source upon Mauna Loa, it was noticed that the stream would sometimes come to an entire standstill and then break out with renewed vigor at intervals. These were intervals of about a month. Well, I noticed that they also came about the time of the new moon, and people laughed at me to think that such a thing as the moon had anything to do with it, and considered it impossible. However, I wrote up to Hilo, saying that I expected an advance in a part of the flow at such and such a time, with relation to the moon. Well, the flow came as predicted and that was also the last flow. Whether it was my prediction or the incantation of the Princess Ruth, according to ancient Hawaiian rites, that stopped further flows, I have not yet determined.

"That was what set me to thinking about the effect of this gravitation. I am inclined to attribute the precipitation of volcanic action very largely to this 'stress of gravitation,' as I call it. If the earth is molten it would certainly cause flows of lava, and if solid, the heat developed might be sufficient to make lava, as well as to change solids into gases and cause explosions.

"Kilauea and Mauna Loa are not explosive volcanoes; that is, in their main characteristics. I don't think the sea water gets under Kilauea, and certainly such outflows as come from Mauna Loa cannot be produced by gaseous action.

"The volcanoes in the West Indies, and especially the one on Martinique, might be connected with an influx of sea water through a broken stratum. I think also that there are periods when the earth is more susceptible to volcanic action. There is some reason why the great flows from Mount Etna and from Mauna Loa have been more or less synchronus. I don't say that these two volcanes are connected, but the same influences which cause outbreaks in one part of the earth are liable to cause outbreaks in another. In 1878, while visiting Kilauea, I went over the intervals of the great lava formations on Hawaii, and it struck me that eleven or twelve year periods would coincide more or less; that is, counting the flows of the 50s as one group by itself. It was not for many years afterwards that I found any correspondence between these and the sun spot periods. When I found a table of sun spot periods, I was surprised to find there was such a correspondence. I make the distinction between mere crater activity of the volcano and an actual flow of lava. We who have lived on Hawaii are best able to judge about the relative importance of eruptions, and not those who simply pick up a miscellaneous list from the encyclopedia and strike an average period in that way.

"There is one other significant thing. The only sun spot period when there was no flow here was in 1812. In that year there were terrific outbursts in the West Indies and South America all at the same time. St. Vincent's volcano broke out then, I believe. Since then I have found that scientists elsewhere grant that volcanic activity and earthquakes are more common at the time of the new and full moon. It is worth noticing that the present period

(Continued on Page 4.)

LOOKING INTO THE CRATER.

—Photos by Davey.

VIEW FROM VOLCANO HOUSE.

Prof. Kellogg Sees New Fires in Crater.

Professor V. L. Kellogg and Professor R. E. Allardice of Stanford University returned last Saturday evening on the Kinau from a visit to the volcano. Professor Kellogg secured several excellent views, one of which takes in the lava lake bed of the old flow, in the foreground, shows the volcanic cliffs of 600 feet in height, and in the background exhibits the active crater from which a heavy, thick cloud is seen escaping. This cloud overhangs the whole scene and ascends into the air for hundreds of feet. Professor Kellogg has taken a full series of pictures, beginning with the one above mentioned, focussed from a distance of three and one-half miles, and by gradual stages has reached the active crater itself. The pictures show the cracks and fissures in the old lake and bring out very clearly the conformation of the upper surface.

In an interview Professor Kellogg stated that the lava bed, which must be traversed before arriving at the smoking crater, is very hot and at no greater depth below the surface than three feet, fire is present. From the outer edge of the old lava lake to the foot of the crater (about three and one-half miles) there is a gradual rise amounting to about 300 feet, and this area is crossed and intersected by crevices formed by the irregular cooling of the lava.

Arriving at the very edge of the burning mountain's mouth, Professor Kellogg and others of the party were enabled to get a good view into the volcano, for as favorable winds blew away the strong, sulphurous steam issuing forth, the internal action was clearly visible. Professor Kellogg states with the assurance of an eye witness that fire was visible. The burning flow of lava in sight was accompanied by a sound of sizzling or like a sound of the waves of the sea dashing against rocks. There seems to be little doubt that Kilauea is on the eve of a violent outburst, and Professor Kellogg further believes that the whole lava surface of the old lake holds beneath it a vast sea of fire.

The past eruptions of Kilauea taken into consideration, the consensus of opinion seems to be that the expected outbreak will be the greatest on record. While Professor Kellogg would offer no definite prediction, he said he would like to be here for the next two or three weeks. He says that the reports brought by the various ships' officers he can willingly affirm.

Mr. Frank Davey, the well-known photographer, was also one of the passengers returning from a visit to Kilauea per S. S. Kinau, who went for the purpose of securing photographs of the volcano in action. This is Mr. Davey's third trip and each time he has carefully observed the attendant occurrences and he stated that it seemed to him that the anticipated eruption would certainly occur within a few weeks and that it would probably, in his estimation, exceed in violence those of the past.

He says that by thrusting a stick into the outer crater's bed the part interred is consumed by fire, showing clearly that not far below the surface an intense heat is present. It is extremely probable that the whole under surface of this lake is like one immense fiery furnace. Fire was seen from the edge of the crater and though no flowing lava was viewed, from the rushing, swashing sound heard it would tend to indicate that mighty floods of molten matter are internally flowing.

McKenzie's Ambitions.

The rumor that Geo. S. McKenzie has gone to Honolulu to procure the appointment as sheriff of Hawaii to succeed L. A. Andrews is not given much importance by persons well acquainted with McKenzie. He has frequently stated that he was tired of politics and came to Hawaii to get away from the annoyances incidental to a political career. In view of the fact that the citizens of Hawaii are not urging him for the place, and as Sheriff Andrews has not been asked to resign by any one in authority, and as he has no intention of resigning of his own volition just now, it is not likely that McKenzie will be sheriff within the next few days.—Hilo Herald.

Big Crop at Kealia.

KEALIA, Kauai, June 13.—Makee Sugar Company finished grinding the crop for the season of 1902 at 3:30 a. m. June 11. Manager George H. Fairchild announces the crop as a little over 11,200 tons, being 1000 tons over the estimate, and the largest crop the company ever harvested by 1250 tons.